

Title : Regularisation of functional inequalities via Fokker—Planck equation

Abstract : Broadly speaking, we are interested in a question: does the regularising property of diffusion equations help to improve functional inequalities?

In this talk we will present that Nelson's hypercontractivity for Ornstein—Uhlenbeck semigroup and Gross' s log-Sobolev inequality (LSI) can be improved via the Fokker—Planck equation.

In particular, our result on LSI provides complementary result to the recent work by Eldan—Lehec—Shenfeld where they established the deficit estimate of LSI under small covariance assumption.

As for the proof, we employ the flow monotonicity methodology which is nowadays standard in this context. However our argument emerges the situation that two different flows are interacting from each other, which seems to be new phenomena.